

DeSIARD STREET BRIDGE
(Endom Bridge)
Spanning Ouachita River at DeSiard St.
Monroe
Ouachita Parish
Louisiana

HAER No. LA-13

HAER
LA
37-MONR,
4-

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

Historic American Engineering Record
National Park Service
Southeast Region
Department of the Interior
Atlanta, Georgia 30303

HISTORIC AMERICAN ENGINEERING RECORD

DeSIARD STREET BRIDGE (Endom Bridge) HAER No. LA-13

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37-MONR
4-

Location: DeSiard Street spanning the Ouachita River
0.10 miles west of Monroe
Ouachita Parish, Louisiana

U.S.G.S. 7.5 minute Nord, Monroe North Quadrangle (35.D)
Universal Transverse Mercator coordinates:
15.3596060.582740

Date of Construction: 1899. Altered 1928, 1935, 1976

Engineer: M.S. Hasie

Builder: Groton Bridge and Manufacturing Co., Groton, New York

Present Owner: State of Louisiana
Department of Transportation & Development

Present Use: Vehicular bridge.
Center span to be replaced.

Significance: The DeSiard Street Bridge (Endom Bridge) is what remains of one of the fourteen surviving vehicular swing bridges in the State of Louisiana. The original swing span represents the only Pratt type through truss with a sloped top chord in the State of Louisiana. It was financed and built by the City of Monroe and represents an important part of local and regional history for its contribution to the development of the local and regional economy. The bridge was determined eligible for the National Register of Historic Places on November 26, 1984.

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HISTORICAL BACKGROUND

Cultural Setting

The importance of the Monroe/West Monroe area as a trade center along the banks of the Ouachita River and northeast Louisiana was well established years before the Louisiana Purchase helped to unify the American colonization efforts. Early Eighteenth Century traders and explorers traveled the rivers extensively and began to establish their lives in the area. They traded and lived among the locals who were mainly Indians. As the commerce and economy developed, a primitive French settlement named *Prairie de Canots* ("Prairie of the canoes") was established in 1780. This marked the beginning of established and long-term continuing habitation of the locale now called Monroe/West Monroe (Monroe Chamber of Commerce, 1998).

Around 1785, Jean Baptiste (Don Juan) Filhiol and Francoise Poirer Filhiol settled on the west bank of the Ouachita River near the present location of the DeSiard Street Bridge (Endom Bridge). Don Juan Filhiol was a French soldier and land grant recipient from the King of Spain (Downing & Marks, 1995 and Williams, 1991). He set up the first form of government in the area and ordered *Fort Miro* to be built to protect the local village. *Fort Miro* was named the seat of government for Ouachita Parish in 1805 (Monroe Chamber of Commerce, 1998).

Local legend has it that when the first steamboat to travel up the Ouachita River as far as Fort Miro, the local residents were so taken by the event that they renamed the settlement to "Monroe", in honor of the name of the steamboat, the "President Monroe". Coincidentally, James Monroe happened to be President of the United States at the time as well (The Monroe Chamber of Commerce, 1998).

The Ouachita River provided thousands of acres of fertile agricultural land and became the anchor for farming activities and the migrating Americans moving into the area. Before the railroad, river transportation was the life-blood of commerce in the region. The Ouachita River served as the connecting link to other markets in transporting goods and supplies. As the area grew along the east bank of the river around Fort Miro it also began to grow on the west bank of the river. The parish government saw a need to provide accessibility across the river and established a bonded ferry in 1815. The ferry greatly enhanced the trade and economy of the region and provided the impetus for expanded settlement on the west bank of the river.

Early efforts to establish a town on the west bank of the river opposite Monroe began in 1837, when John Campbell submitted a plan for a town to be named Byron to the Ouachita Parish Police Jury. Shortly thereafter in 1840 William Trent, an enterprising native of Georgia, established a warehouse and cotton shed and called it Trent's Landing. By June of 1848, the Town of Trenton was established and registered with the United States Post Office. As the west bank of the Ouachita River grew, so did the economy of the region. By 1859, the town south of Trenton began by John Campbell was recognized by the state legislature and began using the name Cotton Port (See photograph Nos. 31, 32, & 33). As the cotton business flourished so did the Towns of Trenton and Cotton Port until a tragic fire in 1873 virtually destroyed the Town of Trenton. As many of the merchants struggled to rebuild, many moved south to the established and growing Town of Cotton Port.

As the economies in the region grew and the importance of trade and commerce along the Ouachita River at Monroe on the east bank and Cotton Port and Trenton on the west bank developed, there was a need to provide rail service to and from larger markets in the south. The emergence of the railroad in Ouachita Parish began in the 1850s when the Vicksburg, Shreveport and Pacific Railroad was built. It did not survive the American Civil War but was rebuilt in the 1880s and connected its rail line with a bridge spanning the Ouachita River in 1882 linking Monroe on the east bank to Cotton Port, just south of Trenton, and the settlements on the west bank (See photograph No. 34).

The Town of Cotton Port applied to the United States Post Office for a local office shortly thereafter. Unfortunately, the name Cotton Port had already been registered to the village of Cottonport in Avoyelles Parish some ten years earlier. By mid-November of 1883, the name of Cotton Port was changed to West Monroe. During the late 1880s, West Monroe continued to flourish and the Town of Trenton slowly dwindled. By 1905, the U. S. Post Office Department closed its Trenton office, thereafter the town ceased to exist (Downing & Marks, 1995).

Early Bridge History

Although the DeSiard Street Bridge (Endom Bridge) was technically the first vehicular bridge built to cross the Ouachita River at Monroe/West Monroe, it was not the first bridge across the Ouachita at Monroe/West Monroe to be used by vehicular and pedestrian traffic. Ouachita Parish Clerk of Court records show that the Vicksburg, Shreveport and Pacific Railroad Bridge built in 1882, just north of the location of the DeSiard Street Bridge (Endom Bridge), was opened to wagon and foot traffic in 1886 in an agreement between the Monroe City Council, the Ouachita Parish Police Jury and the V.S. & P Railroad.

According to the official records, the railroad company owed \$8,000 in local taxes which the railroad company disputed under the contention that it had been given a statewide ten year tax exemption for systems it had installed in the fall of 1884. A compromise agreement was reached and the parties voided the tax claim with the agreement that the railroad would convert its bridge linking "Old Town" Monroe on the east bank of the river with the settlement of Trenton on the west bank, to permit passage during daylight hours (daylight until one hour after sunset) for pedestrians and wagons. The agreement also called for the City of Monroe returning \$6,000 and Ouachita Parish \$2,000 in taxes which had been collected prior to 1885. The governments agreed not to collect new taxes until 1894 and in return, the railroad would allow its bridge to be used by wagons and pedestrians for a ten year period. In addition, adequate approaches were built at each end of the bridge for general traffic which would be free to the public when not in use by the railroad (*The News-Star*, 1974).

The initial ground work for the DeSiard Street Bridge (Endom Bridge) was begun under the administration of Monroe Mayor A. J. Herring, while the construction of the bridge took place during the administration of Mayor A. A. Forsythe. The bridge was officially authorized by Congress on February 8, 1897 (Modjeski & Masters, 1992, LADOTD, 1995) (See photocopy of authorization in field records item Nos. 1 & 2). Plans for the bridge apparently began shortly thereafter. The following article, reporting the proceedings of the June 8, 1897 meeting of the Ouachita Parish Police Jury, appeared on Friday, June 25, 1897 in Monroe's *The Evening News* (Copied exactly as it was written in *The Evening News*):

"Hon. A. J. Herring, Mayor of the City of Monroe and chairman of the (joint) committees having in charge the Ouachita bridge enterprise accompanied by Mr. M. S. Hasie, special engineer, visited and addressed the

police jury in reference to the proposed bridge. Mr. Hasie presented elaborate drawings with plans (See photograph No. 40), specifications, etc., all of which he clearly and fully explained after thorough discussion Mr. Breard, presented the following resolution:"

"Resolved, that the president of the police jury appoint as a committee five members from this body to meet at 10 o'clock a.m., Wednesday, June 9, inst. (unclear meaning), at the city hall Monroe, La., the "Bridge Committee" of the council of the city of Monroe and M. S. Hasie Esq; special engineer, to consider the drawings, plans, specifications, cost, etc. of a bridge to be used for public travel across the Ouachita river at the city of Monroe, La., and should such plans, specifications cost, etc., be satisfactory to and meet the approval of the said committee, then they are authorized to state that the police jury of Ouachita Parish will appropriate for a period of ten years, One mill of the parish taxes, collected in each year of said period to aid in the construction of said bridge, provided said committee shall make written report at the July 1897, session of the police jury."

"On motion the resolution is adopted and the president appointed Messrs. D. A. Breard, Jr., G.C. Phillips, E. Fudickar, Uriah Millsaps and H. B. Sexton, the bridge committee. W.H. Anders, Pres. J.E. Hanna, Clerk" (*The Evening News*, 1897) (See photocopy of newspaper in field record item No. 4). The City of Monroe approved the construction of the bridge on May 7, 1897 (See photograph of resolution in field record item No. 3).

The project was permitted shortly thereafter by the War Department on July 2, 1897 (Modjeski & Masters, 1992, LADOTD, 1995) (See photocopy of permit in field records item No. 1). A September 18, 1897, document from the Secretary of War establishes the conditions of building crib-work or other structures in the river as part of the bridge work (See photocopy of resolution in field records item No. 2). It was not until November 27, 1897, that the contract for construction of the bridge was let to Groton Bridge and Manufacturing Co., of Groton, New York. The supervising engineer for the project was George Selman. Work on the bridge actually began during the summer of 1898 after the Ouachita River's seasonally high waters receded (See Photograph Nos. 35 & 37).

It appears that the \$88,000 price tag of the bridge was a source of considerable controversy since some of the local government figures believed that the bridge could be constructed for the more reasonable sum of \$55,000. How the lower sum was reached is not known. Money to fund the project was raised from a three mill bridge tax on Monroe's annual assessment of \$1,550,565 which yielded \$4,651.69. Added to this amount was the one mill tax from the Ouachita Parish proper roll on assessments which totaled \$1,743,385 for an annual yield of \$1,743.38. The remaining amount needed was taken from the general fund of the City of Monroe for a period of ten years of the contract with the Groton company. Because of the "high" cost of the bridge, a toll was determined as necessary to pay for maintenance. To facilitate the collection of tolls, the Monroe city council added a house for the bridge watchman and toll collectors on May 2, 1899 (*Ouachita Citizen*, 1974) (See photograph No. 18).

Sometime between the opening of the bridge in 1899 and 1901, the following sections 331 through 337 of the *Charter, Ordinances, Rules and Regulations of the City of Monroe, Louisiana*, were added:

"Sec. 331. [1061,1900,A,168.] The Traffic Bridge erected by the City of Monroe, across the Ouachita River, at the foot of DeSiard Street, shall be open to the free use of the public from one hour before sunrise

to one hour after sunset; during the hours which the bridge is not open the following rate of toll will be collected by the keeper or watchman:

Teams of six animals30 cents
" " four " "25 cents
" " two " "20 cents
" " one " "15 cents
Man on horseback10 cents
Foot passengers05 cents
Loose stock, per head02 1/2 cents

The DeSiard Street Bridge (Endom Bridge) was dedicated July 4, 1899 (*The News-Star*, 1974) (See photograph Nos. 36, 38, & 39). According to local history, Monroe's "Reconstruction Mayor" Fred Endom who served six two-year terms from 1874 to 1884 and 1886 to 1888, was the first person to walk across the bridge, leading the opening ceremony parade. In 1988 the DeSiard Street Bridge was officially named the "Endom Bridge" after the prominent Endom brothers, former Monroe Mayor Frederick Endom (1834-1921) and Judge Robert Henry Endom (1838-1897) (Downing, 1988) (See photographs Nos. 28, 29, & 30).

BRIDGE CONSTRUCTION

Original 1899 Bridge

The only sheet found of what is presumed to be the original engineering drawings for the DeSiard Street Bridge (Endom Bridge) is a sheet detailing the swing span section (Span No. 2). The sheet carries no date or information concerning who prepared the document. It is obviously a working engineering sheet from the information presented (See photograph No. 41).

Another drawing, with no date, entitled "Proposed Highway Bridge over Ouachita River at Monroe, La." was found, but appears to be more of a preliminary or design development drawing of the entire bridge instead of a working engineering drawing. It shows the basic configuration of the proposed bridge with three fixed spans and the swing span. The dimensions for each span are exactly the same when compared to engineering drawings done in 1925, by the Louisiana Highway Commission for proposed repairs to the existing bridge.

The only significant difference in the undated drawing is the 5 piers supporting fixed spans of the structure which are indicated to be made of iron. The central pivot pier is shown to be brick rising from an iron cylinder. All of the piers are shown resting on a group of wood piles. In addition, the drawing does not show the three beam (trestle) spans on the west end (See photograph No. 40).

According to the 1925 repair plans of the original existing bridge, the original bridge consisted of four steel bridge spans and three short steel beam (trestle) spans. The bridge spans included a 295 foot (294'-8" center to center of pins) swing span flanked on the east and west by identical 243 foot (242' - 8" center to center of pins) fixed spans, followed on the west by a 104-foot fixed span (LADOTD, 1995 and Modjeski & Masters, 1992). The substructure of the bridge consisted of a supporting circular brick pier approximately 25 feet in diameter, at the center pivot position of the swing span and five additional piers

each consisting of a pair of circular concrete cylinders on each end and connected by a flat vertical concrete section between each cylinder (See photograph No. 42).

The Original Substructure

The 1925 drawing of the DeSiard Street Bridge (Endom Bridge), done by the Louisiana Highway Commission at the time that repairs were being made, indicate that the original bridge substructure consisted of six piers (See Photograph No. 42). Beginning on the east bank in Monroe an un-numbered abutment, approximately 42 feet in height, is shown supporting the east end of a fixed truss labeled as bridge span No. 1. Proceeding to the west, the next pier is shown as Pier No. 1. It is approximately 60 feet in height and supports the western end of the eastern most fixed truss No. 1 and also serves as the rest pier for the east end of the swing span labeled as bridge span No. 2. This Pier No. 1 was made-up of concrete cylindrical columns on the ends connected or separated by a flat vertical concrete section between each cylinder (See photograph Nos. 18 & 43).

The circular brick pier supporting the swing span is shown as Pier No. 2 and is also approximately 60 feet in height. It is located at the center of the swing span and acts as the pivot point for the span. The pier also supports the rim bearing turning drum and mechanisms which allow the span to be turned (See photograph No. 41). Proceeding further west the next pier is shown as Pier No. 3 and is also approximately 60 feet in height. It is a concrete pier similar in design to Pier No. 1 and acts as the rest pier which supports the western end of the swing span and the eastern end of the bridge span labeled as No. 3.

Proceeding further west the next pier is shown as Pier No. 4 and is approximately 50 feet in height. It is shown as a concrete pier and assumed to be similar in design as Pier Nos. 1 and 3. It supports the western end of the fixed span No. 3 and the eastern end of the fixed span labeled as No. 4. The last pier shown as Pier No. 5 is approximately 24 feet in height and is assumed to be similar in design as Pier Nos. 1, 3 & 4. It supports the western end of bridge span No. 4 and the eastern end of the first of three beam (trestle) spans listed as span No. 5. The remaining beam (trestles) spans, labeled as spans 6 & 7, are supported by what appear to be small vertical members resting on what appear to be small concrete pads.

The Original Superstructure

Fixed Bridge Spans Nos. 1 & 3

The main superstructure in the original design of the DeSiard Street Bridge (Endom Bridge) consisted of four steel through truss spans (See photograph Nos. 40 & 42). Span No. 1, beginning from the east bank of the Ouachita River on the Monroe side and span no. 3 west of the swing span, were each 243 foot (242'-8" center to center of pin) pin connected Petit through trusses (Modjeski & Masters, 1992 and LADOTD, 1995). Historic drawings and photographs indicate that each span had six panels (See photograph Nos. 17, 18, 40, & 42). The two central panels, each approximately 33 feet in length had horizontal and parallel top and bottom chords and simple "X" bracing. A small vertical member extended from the intersection of the "X" bracing to the bottom chord in each panel. The two panels on each side of the two central panels had sloped top chords, each top chord having a slightly different slope. The diagonal bracing in each of these panels extended from three corners of the box to the approximate center point, except from the lower left corner. A small vertical member extended from the center intersection to the bottom chord in each Panel.

The main vertical members and chords of each span appear to be box members made of pairs of channels braced with lacing bars. The portal end posts and top chords appear to have solid top riveted cover plates (See photograph No.18). The majority of diagonal members appear to have been pairs of small size eyebars. The trusses appear to have been pin connected throughout. From historic photographs, it appears that most of the built-up steel members were held together with rivets. Each panel appears to have been connected with small built-up and laced horizontal struts which connected the top chords. Lateral bracing was accomplished with the use of tie bars. Sway bracing was composed of members made of built-up sections braced with lacing and laterally placed steel tie bars (See photograph Nos. 17 & 18).

The original bridge design for these spans also included a 5 foot cantilevered walkway on each side of the main bridge span. The walkway was bordered with a 42 inch high guard rail of a somewhat restrained design consisting of horizontal rails divided on the lower portion by smaller vertical and horizontal members and the upper part divided with diagonal members connected by a small circular rosette at the center (See photograph Nos. 17 & 18 and field record item Nos. 11 & 12).

Historic photographs show that an ornate finial was positioned on both top chords of each span at the point where each vertical member intersected the top chord. The finial appears to be made of iron with a repetitive design using half circles and the *fleur-de-lis* motif. The design was made even more elaborate at the entry portal on the Monroe (east) side as shown in historic photographs (See photograph Nos. 17 & 18). Each portal of the fixed spans, had a wide horizontal panel braced with lacing, riveted to the top portal strut and the bottom portal bracing (See Photograph Nos. 17 & 18).

In the original design of the fixed spans, the roadway was made of 4" x 10" x 19'-0" creosote flooring planks. Each plank was to be secured by 7 inch spikes into 6" x 14" x 18'-0" wood stringers. The wood stringers were placed at 2' - 2 5/16" apart measured from the outside of one stringer to the outside of the other. Except for the single outside stringer, each interior stringer was doubled (See photograph No. 44).

The Swing Span (Span No. 2)

The swing span is a 295 foot (294' - 8" center to center of pin) pin connected through truss throughout. It is the only swing span through truss in Louisiana with a sloped top chord. It is also the only section remaining of the original 1899 bridge. The verticals and chords are box members made of pairs of channels braced with lacing bars. Vertical members vary in depth from 6 inches to 10 inches as they approach the central section of the span. The section created by the pairs of channels is 11 1/2 inches wide. Rivets holding the vertical members together are probably 3/4 to 7/8 inch in diameter, judging from the head size diameter of 1 1/4", and the diagonal lacing bars are 1 1/2 inch wide (See photograph Nos. 1 through 16 and No. 41 and field record item No. 6).

The majority of diagonal members are pairs of small size eyebars. These eyebars increase in size as they approach the center of the span. Outer eyebars begin at 3 inches wide and are 3/4 inch thick. They increase accordingly to 13/16 inch, 7/8 inch, 15/16 inch and 1 inches in thickness. The last two eyebars near the center section are 4 inches wide (See field record item No. 7). Built-up diagonal members between the verticals are made of channels creating sections which are 6 inches thick by 14 3/4 inches in width. Rivets holding together these members are approximately 3/4 inch in diameter (See photograph Nos. 1 through 16 and No. 41 and field record item No. 6).

The central point of the span is basically an "A" frame configuration consisting of two diagonal built-up members each composed of 12 inch steel channels, spaced 12 inches apart and braced by 2 inch lacing bars creating a section which is 18 ½ inches wide. Rivets connecting the parts are probably ¾ to 7/8 inch in diameter, judging from the head size diameter of 1 ¼" to 1 3/8" (See photograph Nos. 1 through 16 and No. 41 and field record item No. 8).

Upper horizontal struts between top chords are built-up channels with lacing bars held together creating a section which is approximately 10 to 11 inches deep and 5 ½ inches wide. Lateral tie rods between sides are 1 to 1 ¼ inches in diameter (See photographs No. 1 through No. 16 and field record item No. 9). Lower horizontal chords which carry the bridge floor beams are built-up members composed of 10 inch steel channels braced 21 inches apart with lacing bars. The section created at the bottom chord is 10 inches deep and 21 inches wide (See photograph Nos. 1 through 16 and No. 41 and field record item No. 13).

The central rim-bearing turning drum with gear mechanisms consists of a large outer steel drum approximately 22 feet in diameter. The drum is divided into six pie shapes by 16 inch deep steel beams meeting at the central point. The drum sits on 24 solid steel wheels, each 6 ½ inches thick and 11 inches in diameter. The center of each wheel is attached to a 1 ¼ inch steel rod which is approximately 9 ft. long and terminates at the outer edge of a 48 inch circular wheel at the center of the drum. From original 1899 drawings, the rods appear to be attached at the base of a cast iron housing and plate at the center of the drum (See photograph Nos. 1 through 16 and No. 41 and field record item Nos. 13, 14 & 15).

The swing span was originally turned by hand from the center of the bridge by as many as six men (LADOTD, 1995). Original ca. 1897 drawings of the swing span indicate that the central turning gear on one side was "geared to two man power". Presumably the opposite side of the turning gear had an identical set of gears and lever affording the turning power of at least four to six men. The drawing also shows a section through the floor beams showing the shaft used to lift the end wheels of the bridge from the center and a section showing the method of raising the latch operated from the center (See photograph No. 41).

The roadway indicated for the "Draw Span" is shown on the 1925 drawings of the original 1899 bridge and is called out to consist of 8" x 12" creosote S4S timbers cut to 14'-11 ½" timber risers which rest on the steel floor beams. Applied to these timber risers were a series of 6 inch (14.75#) I-beams placed at 11 3/8 inch intervals and secured by bolts to the risers. The roadway bed consisted of 4" x 10" x 19'-0" creosote wood flooring planks. Four 4" x 6" creosote nailers were placed at equal distances to secure the flooring with 7 inch spikes to each plank at each nailer. At each side of the roadway, the drawings show a 28 inch high guard rail. The top rail was made from a 8" x 6" timber, bolted to the bridge structure. The lower portion of the guardrail, secured to the roadway deck, was made of a 4" x 6" timber, sitting on top of a 2" x 6" x 12" scupper block, each placed at 5 foot intervals (See photograph No. 44). This apparently allowed water to drain from the roadway bed.

Although the original ca. 1897 engineering drawing of the swing span shows an acorn type ornamental finial at the tops of the vertical sections along the top chord, historic photographs clearly show that the span was adorned with ornamental iron work instead, similar in design to the fixed span Nos. 1 & 3 (See photograph Nos. 41, 17 & 18). Each portal of the swing span, like those of the fixed span Nos. 1 & 3, also had a wide horizontal panel braced with lacing riveted to the top portal strut and the bottom portal bracing (See Photograph Nos. 17 & 18).

At least two historical photographs from the late 1800s and early 1900s show what appear to be a timber shear fence used to aid in guiding boats in the main channel of the river and past the bridge (See photograph Nos. 19 & 20). In the February 8, 1897 authorization by the War Department, the following hand written condition was included in the document (Copied exactly as written):

" 2. In that the space from the rest pier above the Vicksburg, Shreveport and Pacific Railroad bridge to the rest pier below this proposed bridge, on a line with the pivot piers of both, shall be in closed by continuous crib-work or other timber structure, extending above line of highest water."

" 3. That if deemed necessary by the Secretary of War, guide wood shall be built on either or both sides of the channel immediately above and through the draws of the said bridges; plans for which shall be submitted to and receive the approval of the Secretary of War before the superstructure of the proposed bridge is commenced (See field record item Nos. 1 & 2).

Fixed Bridge Span No. 4

The fourth span of the bridge on the west end of the structure was a 104-foot pin connected Parker through truss. Parker bridge trusses were typically used in the mid-to-late nineteenth and twentieth centuries. It is a Pratt type truss with a polygonal top chord. Because of its curved top chord, the bridge is stronger than a regular Pratt while using the same amount of material. The bridge type was commonly used for short spans from between 40 to 200 feet (Comp & Jackson, 1977).

Although there are no original drawings of any consequence related to this particular span of the bridge, the basic design and construction can be seen in several historic photographs to resemble that of the fixed span Nos. 1 and 3 discussed previously. The 1925 repair drawings by the Louisiana Highway Commission show the span to consist to four panels. The center two panels each are of box type construction with parallel top and bottom chords divided vertically and braced using "X" bracing in each panel. The two center panels are each flanked by panels with sloping top chords and horizontal bottom chords and braced laterally in one direction only (See photograph Nos. 40 & 42). It is likely that the original span had members which were composed of built-up steel channels braced with lacing and riveted together. It is also likely that the span had the pedestrian walkways on each side and was adorned with the ornamental iron work seen on the other bridge spans.

The Original Three Beam (Trestle) Spans Nos. 5,6,&7

Very little is known about the three beam (trestle) spans which complete the portions of the bridge as it was originally designed. The 1925 drawing by the Louisiana Highway Commission shows them as span Nos. 5, 6, and 7. The spans between bridge Pier No. 5, trestle Pier No. 6 and No. 7 and No. 7 and the west abutment were approximately 17'- 4" in length. If the trestle width matched the width of the trusses, it was approximately 19'- 6" wide providing for a 17'- 9" roadway between curb rails. According to Modjeski and Masters, Engineers, who did drawings for some repair work, the trestle span included 5 steel beam stringers (See photograph No. 42).

BRIDGE REPAIRS AND CHANGES

1925 - 1928 Repairs and Improvements

Plans for improvements to the DeSiard Street Bridge (Endom Bridge) were completed in October, 1925. Work may have been completed in 1928 (LADOTD, 1995). The work involved included the underpinning of pier Nos. 1 and 3; the replacement and improvements to the roadway of the fixed spans and the swing span; the construction of a Machinery House at the upper portion of the swing span to house electric turning machinery; the installation of motors and gears and installation of new lighting for the bridge (See photograph Nos. 42 through 47).

The plans show that the roadways of all spans were to be replaced with a total of 134,727 board feet of creosote lumber and 25,815 board feet of untreated lumber. The replacement was part of an improvement to the original wood roadway. In the design, the original creosote timber riser roadway substructure was replaced with 6 inch (14.75 #) I-Beams placed at 1'-10 3/4" apart to carry the wooden planks of the roadway deck (See photograph Nos. 42 & 44).

The plans also indicate that 15,000 pounds of structural steel was to be used in the repairs to all bridge spans. In addition, 87,117 pounds of moving structural steel was used in the repairs and additions to bridge span Nos. 1, 3, 4, 5, 6 & 7. Much of this steel included the new I-Beam stringers for the roadway substructure. Some steel was added as webs with stiffeners and fills on the existing floor beams. Other steel was used for normal repairs (See photograph Nos. 42 & 47).

By the 1920s automobile vehicular traffic had become common, so in conjunction with the new roadway floor, 116,536 pounds of steel traffic treads were added. Two steel treads were located on each half of the bridge width and spaced to a dimension which would correspond to the average wheel base centerline of an automobile, approximately 5 feet on center. The treads were beld to the wood roadway flooring with 5/8 inch bolts placed 6 3/4 inches apart (See photograph Nos. 42 & 46).

The plans also called for strengthening bridge pier Nos. 1 and 3. Work involved the installation of 72,800 pounds of steel piles around the base of the original piers. Into this form, 1400 linear feet of untreated wood piles were driven and over 144 cubic yards of class "A" concrete and over 223 cubic yards of class "C" concrete were poured to form a new base for pier Nos. 1 & 3. The class "A" concrete mix was a 1:2:4 mix and was used in the seal course. The class "C" concrete mix was a 1:3:6 mix and was used above the seal course. Steel reinforcement used included salvaged I-Beams from the original floor systems of the fixed spans. Approximately 92 cubic yards of earth was excavated (See photograph Nos. 42 & 43).

1935 Improvements

By the mid 1930s, vehicular traffic on the bridge had increased substantially and the wood timber roadway deck began to be a problem. Maintenance of the wood roadway was costly and frequent. In 1935 the decking on all of the bridge spans was replaced with a steel grating. The grating consisted of a 1-3/4 inch thick, open grid deck which was placed atop the steel I-Beam stringers and channels which were supported by the original floorbeam top flange (Modjeski & Masters, 1992) (See photograph No. 12).

1974 Bridge Collision and Collapse

At 8 p.m. on the evening of April 8, 1974, a barge owned by the Port Arthur Towing Co., rammed Pier No. 3, the rest pier for the western end of the swing span and the eastern pier for the Petit through truss No. 3. According to the local newspaper, after the barge hit the pier, "the span twisted and rolled to one side and collapsed into the river" (*Monroe Morning World*, 1974 and *Ouachita Citizen*, 1974) (See photograph Nos. 24 & 25).

The bridge connecting Monroe and West Monroe was closed indefinitely until damage assessments could be made. Much controversy surrounded the rebuilding of the bridge, including talk that perhaps the bridge should not be rebuilt. The bridge was owned by the City of Monroe and was to be the responsibility of the City to restore or rebuild it (*The News-Star*, 1976). It wasn't until October of 1974 that Governor Edwin Edwards announced that the State of Louisiana would cover the cost of repairing the bridge and that engineering studies had already begun by the State Highway Department (*Monroe Morning World*, 1974).

1976 Repairs and Improvements

It apparently took from October 1974 to April of 1976 to complete the plans for the work to rebuild the DeSiard Street Bridge (Endom Bridge) which had already been closed for over two years. The State Highway Board awarded a contract to Louisiana Paving Co., Inc. of Ruston for \$1,181,865.14 to rebuild the bridge in early April of 1976. The low bid for the work was 27.4 percent above the original projected cost of \$854,000.

Sometime around June 1, 1976, work on the project began and according to the contract the project was to take 150 days. The first portion of the project included the demolition of the remaining fixed through truss spans of the original bridge. This included span No. 1, the original 1899 Petit pin connected through truss which matched the design of the collapsed span No. 3 and the smaller original 1899 Parker pin connected through truss span No. 4 on the western end of the bridge (See photograph No. 26). The work also included the removal of the original 1899 beam (trestle) span Nos. 5, 6, & 7 on the western end of the bridge. The original 1899 swing span was to remain (*Monroe Morning World*, 1976).

New portions of the bridge replacing the demolished original steel spans included the construction of a 30 foot wide reinforced concrete roadway and prestressed concrete beam system resting on new reinforced concrete river piers. This new modern highway traffic bridge would be built with new approaches from each bank of the river to intersect with the remaining original 1899 swing span. The new spans were designed to provide for two 15-foot wide traffic lanes and 32-inch high railings to meet federal guidelines (*The News-Star*, 1992) (See photograph No. 1 through No. 16 and field record item Nos. 17 & 18). Work on the new concrete approaches was completed in July of 1977, some 14 months after work began. A contract for repainting the original swing span portion of the bridge for \$160,500 with Alpha Construction Company of Shreveport was initiated in December of the same year. It wasn't until March 12, 1979 that the DeSiard Street Bridge (Endom Bridge) officially reopened to vehicular traffic, almost 5 years after its closing in 1974.

PROPOSED BRIDGE IMPROVEMENTS TO DATE

Description of New Work

The State of Louisiana and the Louisiana Department of Transportation and Development are proposing that a new drilled shaft supported pivot pier and swing span be constructed across the Ouachita River to replace the existing original 1899 circular brick pivot pier and pin connected through truss swing span of the DeSiard Street Bridge (Endom Bridge) (See field record item Nos. 19 & 20). The project includes the replacement of the existing brick pivot pier with a new one located 11.0 meters (36.0 feet) east of the existing pier. The project also includes the construction of a new 90.8-meter (298-foot) bobtailed plate girder swing span with a combination open grid and concrete deck (LADOTD, 1995) (See field record item No. 21).

The new pivot pier is to be built on an offset alignment in order to provide better navigational alignment in the navigational channel. The new bridge will provide 45.7 meters (150 feet) of horizontal clearance on the west side of the pivot pier and 25.8 meters (84.5 feet) on the east side. When the bridge is in the open position, vertical clearance will be unlimited.

Constructing the pivot pier for the new swing span in an offset position will allow the existing span to remain in service during construction of the pier. The new swing span will be built at an off-site location while the pivot pier is being constructed. This will allow for minimal interruption of vehicular traffic.

The Federal Highway Administration is the lead Federal Agency for the project and the Coast Guard is a cooperating Federal Agency. The project is scheduled to be let for bids in 1998. The construction cost for the work is estimated to be approximately \$5,500,000 (LADOTD, 1995).

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